

## 26939 - Illumination and Colorimetry

### Syllabus Information

**Academic year:** 2023/24

**Subject:** 26939 - Illumination and Colorimetry

**Faculty / School:** 100 - Facultad de Ciencias

**Degree:** 447 - Degree in Physics

**ECTS:** 5.0

**Year:**

**Semester:** Second semester

**Subject type:** Optional

**Module:**

### 1. General information

The objective of this subject is to understand and assimilate the most important and general concepts, theories and models of the two thematic and conceptual blocks that compose it: Lighting and Colorimetry. The aim is that the student has a global vision of these concepts as well as their fields of application and the specific regulations that affect them. These approaches and objectives are aligned with the following Sustainable Development Goals (SDGs) of the 2030 Agenda of United Nations (<https://www.un.org/sustainabledevelopment/es/>), in such a way that the acquisition of the learning results of the subject provides training and competence to contribute to some extent to their achievement:

- Goal 4: Quality Education.
- Goal 9: Industry, Innovation and Infrastructure

### 2. Learning results

- Be able to relate photometric and colorimetric measurements to the visual response of the eye.
- Be able to measure colour coordinates and express them in colorimetric unit systems.
- Be able to characterize, from the optical point of view, radiation sources, luminaires and materials.
- Be able to design indoor or outdoor lighting projects, choosing the most appropriate luminaires and lamps, as well as their location.
- Be able to handle lighting calculation programs.

### 3. Syllabus

#### Theory

- Topic 1. Visual photometry. CIE detectors.
- Topic 2. Colorimetry. Colour specification. CIE diagram.
- Topic 3. Colour systems. Applications.
- Topic 4. Photometry and physical colorimetry.
- Topic 5. Lamps and luminaires. Optical characterization.
- Topic 6. Outdoor lighting techniques.
- Topic 7. Interior lighting techniques.
- Topic 8. Basic regulations.
- Topic 9. Specific projects: calculations and simulations.

#### Practices

- Practice 1. Calibration of lux meters and spectrophotometers.
- Practice 2. Operation of a spectrophotometer: characterization of plates and glasses.
- Practice 3. Characterization of lamps and luminaires.
- Practice 4. Indoor energy audit.
- Practice 5. Outdoor energy audits.

#### 4. Academic activities

- Master classes: 35 hours. Theoretical sessions in which the contents of the subject are explained.
- Problems and cases: 5 hours. Problem solving and case studies of each topic.
- Laboratory Practices: 10 hours. Simulation tools and laboratory instrumentation will be used to address the issues raised in theory.
- Teaching assignments: 10 hours. This includes both the evaluable teaching assignments and the preparation of reports of laboratory practices.
- Personal study. 62.50 hours
- Assessment tests. 2.50 hours

#### 5. Assessment system

Continuous assessment Attendance to the practical classes is a prerequisite for this evaluation modality.

- Resolution of problems, practices and other activities proposed by the teachers of the subject. 70% of the final grade.
- Performance of a theoretical-practical test. 30% of the final grade.

Without continuous evaluation (passing the subject by means of a single global test). Theoretical-practical exam. 100% of the final grade.

- Theory exam and problems. 60% of the final grade
- Practice exam. 40% of the final grade.